

WHAT IS CLAIMED IS:

1. A cleaning and releasing device for spraying  
a jet flow onto an object to be cleaned, comprising:

an injection nozzle;

5 operating means for supplying and stopping a  
pressurized liquid to said injection nozzle, said  
operating means being provided in said injection nozzle  
or in the vicinity thereof; and

10 detecting means for detecting supply and stop of  
the pressurized liquid generated by an operation of said  
operating means, said detecting means being provided in  
a proper position on a flow passage of the pressurized  
liquid;

15 wherein the supply and stop of a pressurized gas  
to said injection nozzle is controlled based on a result  
of the detection by said detecting means.

2. A cleaning and releasing device according to  
claim 1, further comprising:

20 a hand valve provided on the flow passage of the  
pressurized liquid in said injection nozzle or in the  
vicinity thereof and serving to supply and stop the  
pressurized liquid to the injection nozzle;

25 a switching valve provided in a proper position on  
a flow passage of the pressurized gas and serving to supply

and stop the pressurized gas to the injection nozzle;

flow detecting means provided in a proper position on the flow passage of the pressurized liquid and serving to detect presence of a flow of the liquid; and

5 a controller for controlling a switching operation of the switching valve based on a result of the detection transmitted from the flow detecting means;

wherein the switching valve is controlled to the supply and stop the pressurized gas depending on the presence of the flow of the pressurized liquid generated by a switching operation of the hand valve.

3. A cleaning and releasing device according to claim 1, further comprising powder and granular supply means being provided on a flow passage of the pressurized gas, and supply and stop of the powder and granular material is controlled based on a result of the detection related to the supply and stop of the pressurized liquid to said injection nozzle.

20

4. A cleaning and releasing device according to claim 3, wherein the supply of the pressurized gas is started and the supply of the powder and granular material is started based on the detection of the supply of the 25 pressurized liquid to said injection nozzle when injection

is to be started, the supply of the powder and granular material is stopped and the supply of the pressurized gas is stopped after a predetermined time passes based on the detection of the stop of the pressurized liquid  
5 to said injection nozzle when the injection is to be stopped.

5. A cleaning and releasing device for sucking a gas through a jet flow of a pressurized liquid supplied  
10 to an injection nozzle and for spraying a jet flow formed by supplying a powder and granular material in a proper process onto an object to be cleaned, said device comprising:

15 operating means for operating supply and stop of a pressurized liquid, said operating means being provided in said injection nozzle or in the vicinity thereof; and  
detecting means for detecting the supply and stop of the pressurized liquid generated by an operation of  
20 said operating means, said detecting means being provided in a proper position on a flow passage of the pressurized liquid;

wherein supply and stop of the powder and granular material is controlled based on a result of the detection by said detecting means.

6. A cleaning and releasing device comprising:

a liquid tank for storing liquid;

a pump for pressurizing the liquid in said liquid tank to supply pressurized liquid;

5 a liquid supply passage for connecting said liquid tank to said pump;

an injection nozzle for injecting the pressurized liquid;

10 a pressurized liquid flow passage for connecting said pump to said injection nozzle;

a pressurized gas source;

15 a pressurized gas supply passage for connecting said pressurized gas source to said injection nozzle;

a sensor provided on one of said liquid supply passage and said pressurized liquid flow passage to detect supply and stop of the pressurized liquid from said liquid tank;

20 an operating portion disposed in said injection nozzle or in the vicinity thereof on said pressurized liquid flow passage to thereby supply and stop the pressurized liquid; and

25 a controller connected to said sensor and said pressurized gas supply passage, said controller detecting supply and stop of the pressurized liquid detected by said sensor to thereby control supply and stop of the pressurized gas from said pressurized gas supply passage

to said injection nozzle based on a result of a detection by said sensor.

5           7. A cleaning and releasing device according to claim 6, further comprising a powder and granular material tank connected to said pressurized gas supply passage, and supply and stop of powder and granular material is controlled by said controller based on the supply and  
10 stop of the pressurized liquid detected by said sensor.

8.         A cleaning and releasing device comprising:  
a liquid tank for storing liquid;  
a pump for pressurizing the liquid in said liquid  
15 tank to supply pressurized liquid;  
a liquid supply passage for connecting said liquid tank to said pump;  
an injection nozzle for injecting the pressurized liquid;

20         a pressurized liquid flow passage for connecting said pump to said injection nozzle;

an air supply passage connected to said injection nozzle, said air supply passage sucking air from outside based on an ejector effect of a jet flow of the pressurized  
25 liquid;

a sensor provided on one of said liquid supply passage and said pressurized liquid flow passage to detect supply and stop of the pressurized liquid from said liquid tank;

5 a powder and granular material tank connected to said air supply passage and supplying powder and granular material;

an operating portion disposed in said injection nozzle or in the vicinity thereof on said pressurized liquid flow passage to thereby supply and stop the  
10 pressurized liquid; and

15 a controller connected to said sensor and said pressurized gas supply passage, said controller detecting supply and stop of the pressurized liquid detected by said sensor to thereby control supply and stop of the powder and granular material from said powder and granular material tank to air supply passage based on a result of a detection by said sensor.